

Extension of the phasmid genus *Presbistus* to Cambodia with a new species and notes on genitalia and captive breeding (Phasmida, Aschiphasmataidae, Aschiphasmatinae)

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Academic editor: Tony Robillard | Received 26 November 2021 | Accepted 22 January 2022 | Published 5 July 2022

<http://zoobank.org/94C8E222-0843-41CB-8629-3DACD4228BF1>

Citation: Bresseel J, Constant J (2022) Extension of the phasmid genus *Presbistus* to Cambodia with a new species and notes on genitalia and captive breeding (Phasmida, Aschiphasmataidae, Aschiphasmatinae). Journal of Orthoptera Research 31(2): 105–117. <https://doi.org/10.3897/jor.31.78520>

Abstract

A new species of *Presbistus* Kirby, 1896, *Presbistus vitivorus* sp. nov., is described from Cambodia based on both sexes, nymphs, and eggs. Male genitalia and vomer are described and figured. Illustrations of adults, nymphs, specimens in situ, host plants, a distribution map and records on biology and breeding in captivity are provided. The host plants of the species belong to the family Vitaceae. The genus *Presbistus* and the family Aschiphasmataidae are recorded from Cambodia for the first time. The species diversity and the distribution of the genus are discussed, and it is shown that the genus is restricted to Sundaland. A nomenclature for the morphology of the dissected vomer is proposed and tries to homologize the previously used terms.

Keywords

Aedeagus, Aschiphasmatini, Phasmatodea, stick insect, Vitaceae, vomer

Introduction

The genus *Presbistus* Kirby, 1896 belongs to the Aschiphasmatini in the subfamily Aschiphasmatinae and currently contains nine species. Phylogenetic studies have shown Aschiphasmatinae to be monophyletic and the sister group to all remaining Euphasmatodea (Simon et al. 2015).

Presbistus is currently recorded from India, Sri Lanka, Peninsular Malaysia, Sumatra, Java, and Borneo (Brock et al. 2022). Within the Aschiphasmatinae, the genus is characterized by triangular or spine-like tegmina, uniform translucent brown anal region of hind wings, and cylindrical or conical cerci in both sexes. The male has a well-developed vomer and has the end of the abdomen distinctively swollen and club-shaped. The eggs are slightly longer than high and lack setae (Bragg 2001, Seow-Choen 2016).

The vomer, a sclerotized derivative of sternum X, was first introduced by Pantel (1890) as “vomer sous-anal”. The vomer is used during mating and clasps the posterior margin of sternum VII of the female, which has evolved into a praeopercular organ (Bradler 2003). Pantel (1915) discussed the structure and variability of the vomer in different subgroups of Phasmatodea and detected a vomer in three genera of “Ascepasmini” (= Aschiphasmatini)

including *Presbistus*. Bradler (1999, 2009) argued that the vomer was already present in the phasmatodean ground plan and that it represents a plesiomorphic character for all Euphasmatodea. Most authors have only described the external part of the vomer, and a standardized nomenclature for the different parts of this organ is still needed.

During the study of stick insect specimens collected in the framework of the Global Taxonomy Initiative project “A step further in the entomodiversity of Cambodia,” a species belonging to the genus *Presbistus* could not be attributed to any known species.

The phasmid fauna of Cambodia remains poorly studied (Bresseel and Constant 2018b), and the present paper describes the new species as *Presbistus vitivorus* sp. nov., provides useful characters for differentiation, and gives information on its biology and distribution. A nomenclature for the morphological characterization of the vomer in stick insects is proposed.

Materials and methods

Due to their nocturnal behavior (as in most Phasmida), the specimens of *P. vitivorus* sp. nov. were collected at night. A lightweight, water-proof Petzl MYO RXP head torch was used during collecting. The females were kept alive in a mesh pop-up cage (exo terra explorarium) for producing eggs. The wild caught specimens were euthanized by injection with ethanol. The specimens were then stored in airtight plastic “zip” bags containing wood chips commonly used in rodent cages and sprinkled with ethylacetate (EtOAc) to prevent rotting, mould, and to keep the specimens flexible. The bags were frozen on arrival, and the specimens were mounted at a later date.

A number of pictures of each specimen were taken using a Canon 700D camera (Canon Inc., Ota City, Tokyo, Japan) equipped with a Sigma 50 mm macro lens (Sigma Corporation, Kawasaki, Japan) for adults or with a Leica EZ4W stereomicroscope (Leica Microsystems Ltd., Wetzlar, Germany) with integrated camera for eggs and male genitalia. The images were stacked using CombineZ software (<https://combinezp.software.informer.com>) and optimized with Adobe Photoshop CS3. The distribution map was produced using SimpleMappr (Shorthouse 2010).

Observations were done with a Leica EZ4W stereomicroscope, and measurements were taken with an electronic calliper. The dissection of the vomer and aedeagus was done on a fresh specimen using a needle blade. The vomer was extracted after cutting the membrane around the connective ring that separates the internal apodemes from the externally visible body; the aedeagus was extracted after spreading the poculum and cutting the inner membrane around the integument that separates the internal basal apodeme from the external remaining parts of the aedeagus. After extraction, the vomer and aedeagus were boiled for a few minutes in 10% KOH solution to remove the remaining soft parts then rinsed and examined in 70% ethanol. The vomer and aedeagus were preserved in glycerine in a polyethylene genitalia tube and stored under the label of the corresponding specimen.

The nomenclature of the morphological characters follows Bragg (2001) and that of the egg morphology follows Clark-Sellick (1997, 1998). The description of the coloration is based on live specimens.

Acronyms used for the collections.—

| | |
|-------|--|
| RBINS | Royal Belgian Institute of Natural Sciences, Brussels, Belgium. |
| RUPP | Royal University of Phnom Penh, Cambodian Entomology Initiative, Phnom Penh, Cambodia. |
| VNMN | Vietnam National Museum of Nature, Hanoi, Vietnam |

Abbreviations.—

| | |
|----|----------|
| HT | holotype |
| PT | paratype |

Results

Taxonomy

Family Aschiphasmatae Brunner von Wattenwyl, 1893
Subfamily Aschiphasmatinae Brunner von Wattenwyl, 1893
Tribe Aschiphasmatini Brunner von Wattenwyl, 1893

Genus *Presbistus* Kirby, 1896

Presbistus Kirby, 1896: 475. – Kirby 1904: 475 [in Aschiphasminae]. — Redtenbacher 1906: 78 [redescribed]. — Ragge 1955: 377 [wing venation]. — Bradley and Galil 1977: 200 [in Aschiphasmatina]. — Brock 1999: 147, 154, 184 [species from Peninsular Malaysia]. — Bragg 2001: 323, 642 [species from Borneo]. — Zompro, 2004: 318 [in superfamily Aschiphasmatoidea]. — Otte and Brock 2005: 280 [Catalogued]. — Seow-Choen 2016: 359 [species recorded and figured from Borneo]. — Seow-Choen 2017: 128 [species recorded and figured from Singapore]. — Seow-Choen 2018: 577 [species recorded and figured from Sumatra].

Type species.—*Perlamorpha peleus* Gray, 1835 by original designation.

The genus *Presbistus* can be distinguished from other members of the Aschiphasmatinae by the combination of the following set of characters (adapted from Bragg 2001):

1. Body and legs brown with some black markings.
2. Mesonotum unarmed.

3. Profemora incurving at base; all femora with distinct medioventral carina, armed with at least a few minute spines.
4. Tegmina triangular and spine-like; anal region of hind wing translucent brown.
5. Apex of male abdomen distinctly swollen.
6. Apex of female abdomen almost arrowhead shaped in dorsal view. Subgenital plate with anterior portion globose, posterior half medially keeled and tapering.
7. Cerci cylindrical.
8. Eggs longer than high, lacking setae.

Presbistus vitivorus sp. nov.

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Figs 1–12

Diagnosis and differentiation.—The new species is morphologically most similar and believed to be closely related to two Bornean species: *Presbistus marshallae* Bragg, 2008 and *P. appendiculatus* Bragg, 2001. All three species have a cleft anal segment in males, with the left anal lobe (*lal*) shorter than the right (*ral*), and the right anal lobe twisted. In *P. vitivorus* sp. nov., *ral* first curves down towards the front and later upwards, projecting between the right cercus and the posterior margin of tergum IX. Sternite VII of females of the new species is not rounded or bilobed and does not notably project over the base of the operculum. Instead, the posterior portion of tergum VII is slightly narrowing with the praeopercular organ present as a posterior depression with indistinct lateral carinae and concave posteriorly. The new species also has relatively shorter hind wings compared to most of the other species of the genus. There is only a single species with two subspecies that have shorter hind wings: *Presbistus asymmetricus viridialatus* Seow-Choen, 2020 and *Presbistus asymmetricus asymmetricus* Giglio-Tos, 1910.

Etymology.—The species name is formed from the plant genus name *Vitis*, belonging to the family of the grapevine Vitaceae and the suffix forming adjective *-vorus* (feminine *-vora*, neuter *-vorum*) meaning “eating” or “devouring”. It refers to the feeding preference of the species for plants of the family Vitaceae.

Type material.—**Holotype:** CAMBODIA • ♂; Pursat prov., Phnom Samkos; 12°13'02"N, 102°55'07"E; 15–18 October 2016; GTI project; Leg. J. Constant & J. Bresseel; I.G.: 33.345; RBINS. **Paratypes:** CAMBODIA • 7♂, 22♀; same collection data as holotype; 4♂, 19♀: RBINS; 2♂, 2♀: RUPP; 1♂, 1♀: VNMN.

Additional material.—CAMBODIA • 10♀; Preah Vihear prov., Be Treed Adventures; 16–21 October 2017, 13°29'44"N, 104°42'36"E; GTI Project; Leg. J. Constant & X. Vermeersch; I.G.: 33.551; 8♀: RBINS; 2♀: RUPP • 3♀; Preah Vihear prov., Be Treed adventures; 16–21 October 2017, 13°29'44"N, 104°42'36"E; GTI Project; Leg. J. Constant & X. Vermeersch; I.G.: 33.551; Ex breeding Tim Bollens, 2018; RBINS • 21♀; Preah Vihear prov., Be Treed adventures; 16–21 October 2017; 13°29'44"N, 104°42'36"E; GTI Project; Leg. J. Constant & X. Vermeersch; I.G.: 33.551; Ex breeding Tim Bollens, 2019; RBINS • Six eggs; same data as holotype; RBINS; RUPP.

Remark.—Living females from Phnom Samkos have the alae slightly projecting over the posterior margin of tergum V, but not reaching half of tergum VI. In living females from Be Treed, the

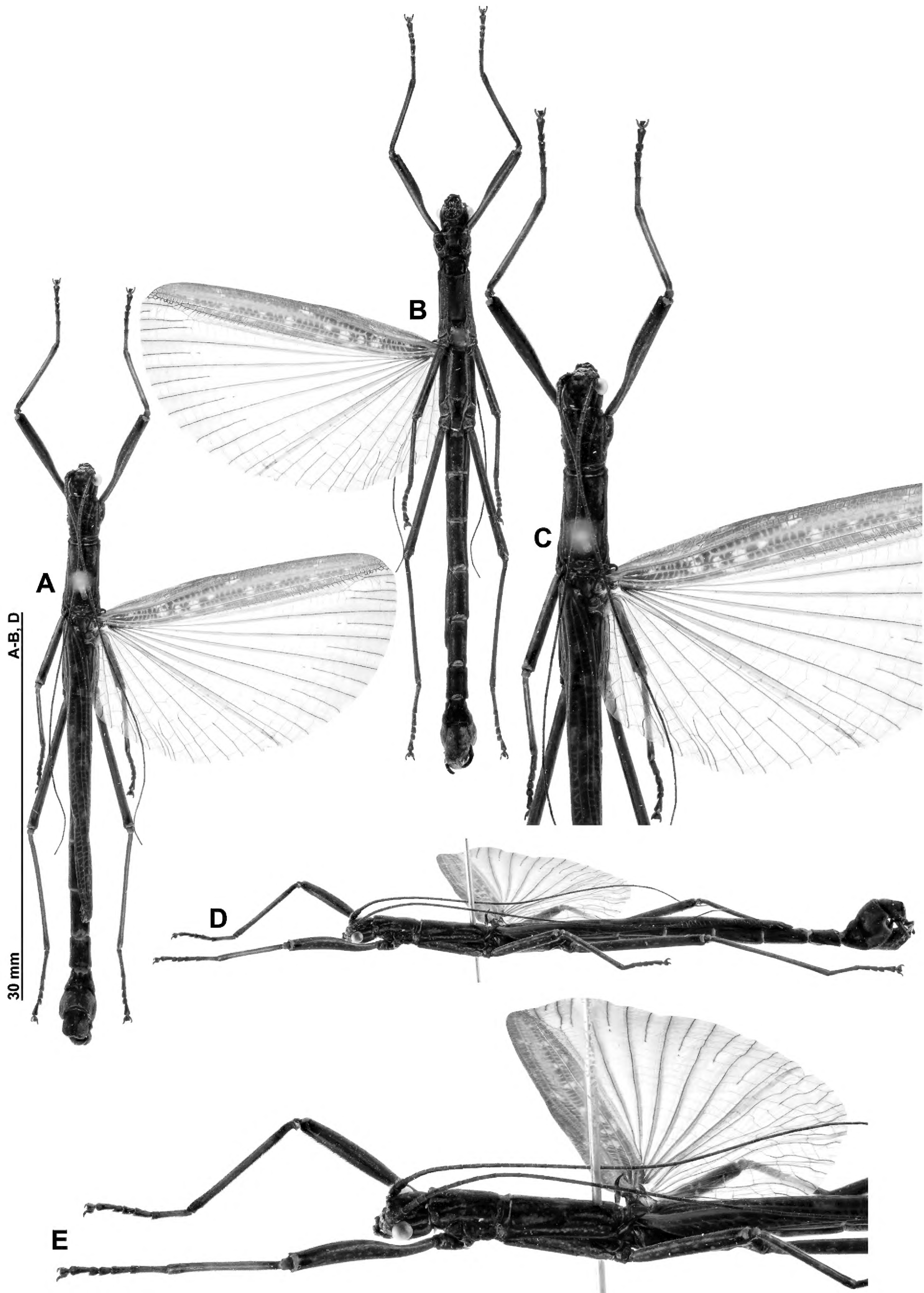


Fig. 1. *Presbistus vitivorus* sp. nov. holotype male (RBINS). A. Dorsal view; B. Ventral view; C. Head and thorax, dorsal view; D. Lateral view; E. Head and thorax, lateral view; C, E not to scale.

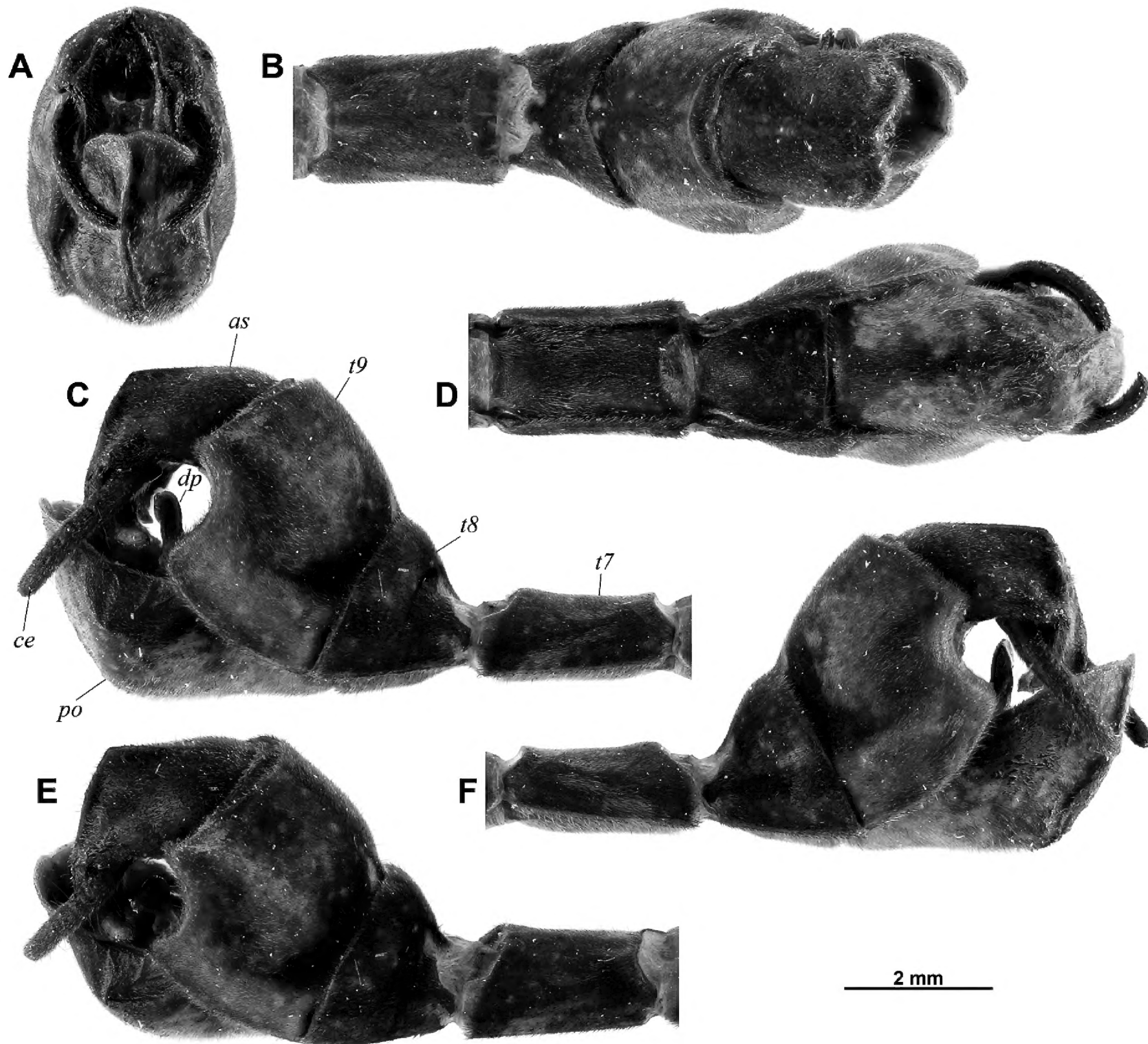


Fig. 2. *Presbistus vitivorus* sp. nov. male terminalia. A. Posterior view; B. Dorsal view; C. Right lateral view; D. Ventral view; E. Right laterodorsal view; F. Left lateral view. Abbreviations: *as*, anal segment. *ce*, cercus. *dp*, dorsal process. *po*, poculum. *t7*, tergum VII. *t8*, tergum VIII. *t9*, tergum IX.

alae are longer and slightly but noticeably projected over half of tergum VI. Breeding efforts have proven that wing length is a stable feature throughout successive generations. Therefore, even if no other differences could be observed, the specimens from Be Treed are not listed as type material.

Description.—Male. (Figs 1–5) **Body.** Setae scattered over complete body, more concentrated in certain areas. Head, pro- and mesonotum brown with distinct black patches. Wings with blackish tegmina; costal area of alae brown with black markings and with basal portion of radius green, anal area infuscate. Femora brownish dorsally with black apex. Tibiae brownish, protibiae with black base and apex; mesotibiae with black apex and metatibiae with indistinct black marking apically.

Head. (Fig. 1C, E) Flattened dorsally, wider than long with a shallow longitudinal impression posteriorly. Eyes strongly protruding. Two minute impressions between the bases of antennae. Antennae reaching about half of abdomen; scapus subcylindrical, roughly as long as pedicellus. Pedicellus cylindrical. First flagellomere longer than pedicellus;

flagellomere II shorter than half the length of previous one; following segments varying in length.

Thorax. (Fig. 1C, E) Pronotum longer than wide with posterior margin concave and with a median line in the prozona; prozona slightly higher than metazona from lateral view; lateral margins slightly concave from dorsal view, posterior margin more or less straight. Mesonotum about one third longer than pronotum and parallel-sided; anterior margin slightly concave with raised rim.

Wings. (Fig. 1A, B) Tegmina small, elongate, triangular, and apically acute; pointing straight upwards. Hind wings reaching roughly halfway tergum VI.

Legs. (Fig. 1A, B) Profemora incurved basally. Femora with carinae indistinct, outer ventral carinae with few minute spines. Tibiae with carinae indistinct.

Abdomen and terminalia. (Figs 1A, B, D, 2–5) Terga II–VII of uniform width and terga II–VI only slightly varying in length; tergum VII (*t7*) distinctly shorter; tergum VIII (*t8*) and IX (*t9*) widening towards the posterior; X narrower than IX. Anal segment (*as*) with indistinct mediolongitudinal carina, slightly widening towards the posterior; apex notched. Right anal lobe

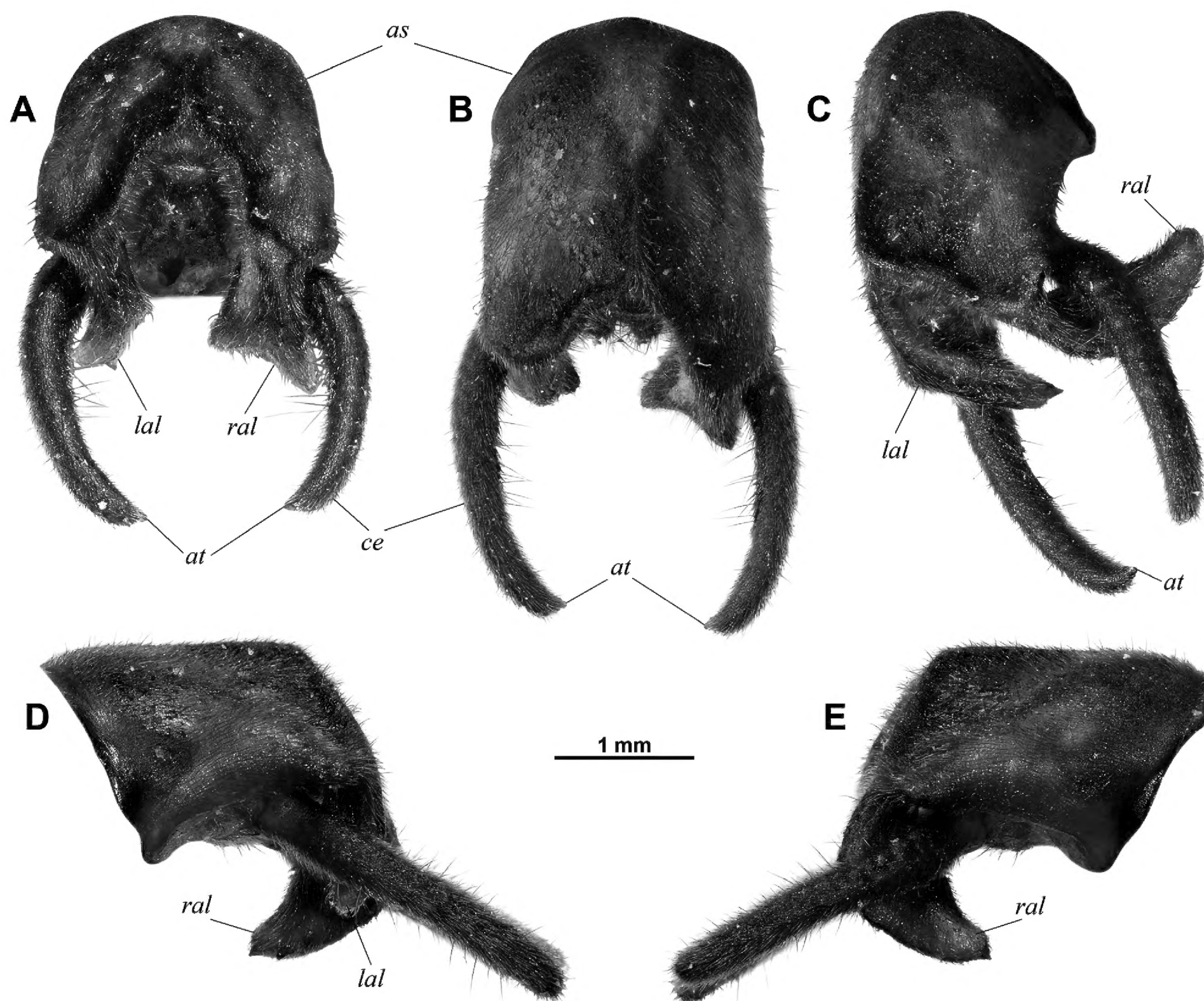


Fig. 3. *Presbistus vitivorus* sp. nov. male anal segment. A. Posterior view; B. Posterodorsal view; C. Right posterolateral view; D. Left lateral view; E. Right lateral view. Abbreviations: *c*, cercus. *lal*, left anal lobe. *ral*, right anal lobe.

(*ral*) broad at base, distinctly elongated and strongly twisted and curved, projecting between cercus and posterior margin of tergum IX. Left anal lobe (*lal*) distinctly shorter than right one and curved. Cerci (*ce*) black and long, incurved and round in cross section with an apical tooth. Poculum bulgy and angular (110° angle), posterior part with fine mediolongitudinal carina, apex rounded.

Vomer (Fig. 4) well developed. Body (*b*) with narrow base, distinctly elongated, tapering and ending in an apical spine (*as*); ventral part of body distinctly longer than dorsal part. Left and right basal apodemes (*lba*, *rba*) narrow and elongated, almost as long as the vomer body. External body separated from internal apodemes by sclerotized connective ring (*cr*). Apodemes almost parallel, slightly directed towards each other.

Aedeagus (Fig. 5) with spatulate, elongate, and curved basal apodeme (*ba*) prolonged anterodorsally by a strongly sclerotized plate (dorsal sclerite). Sclerotized plate with elongated club-shaped right basal process (*rbp*), with blunt subtriangular left basal process (*lbp*) and with elongated curved dorsal process (*dp*) bearing minute teeth on anterior surface (Fig. 5F). Caudal portion of aedeagus composed of a series of membranous lobes (*ml*).

Female. (Figs 6, 7)

Body. Setae scattered over complete body, more concentrated in certain areas. Female colored as male except for abdomen. In the female, tergum VII conspicuously paler than the rest of the abdomen.

Head. (Fig. 6C, E) About as long as wide, flattened dorsally. Eyes strongly protruding. Two minute impressions between the bases of the antennae. Antennae reaching about half of abdomen; scapus flattened at base, cylindrical at apex, slightly longer than pedicellus. Pedicellus cylindrical. First flagellomere longer than pedicellus; flagellomere II shorter than half the length of previous segment; following segments vary in length.

Thorax. (Fig. 6C, E) Pronotum longer than wide with anterior margin slightly concave and with a median line in the prozona; prozona slightly higher than metazona from lateral view; impression between pro- and metazona centrally flattened, almost circular, sublaterally with a minute hole; lateral margins slightly concave from dorsal view, posterior margin more or less straight. Mesonotum almost twice as long as pronotum and parallel-sided, with posterior margin slightly concave with a raised rim and anterior margin almost straight.

Wings. (Fig. 6A, B) Tegmina small, elongate, triangular, and apically acute; pointing straight upwards. Hind wings projecting over posterior margin of tergum V but not reaching posterior margin of tergum VI.

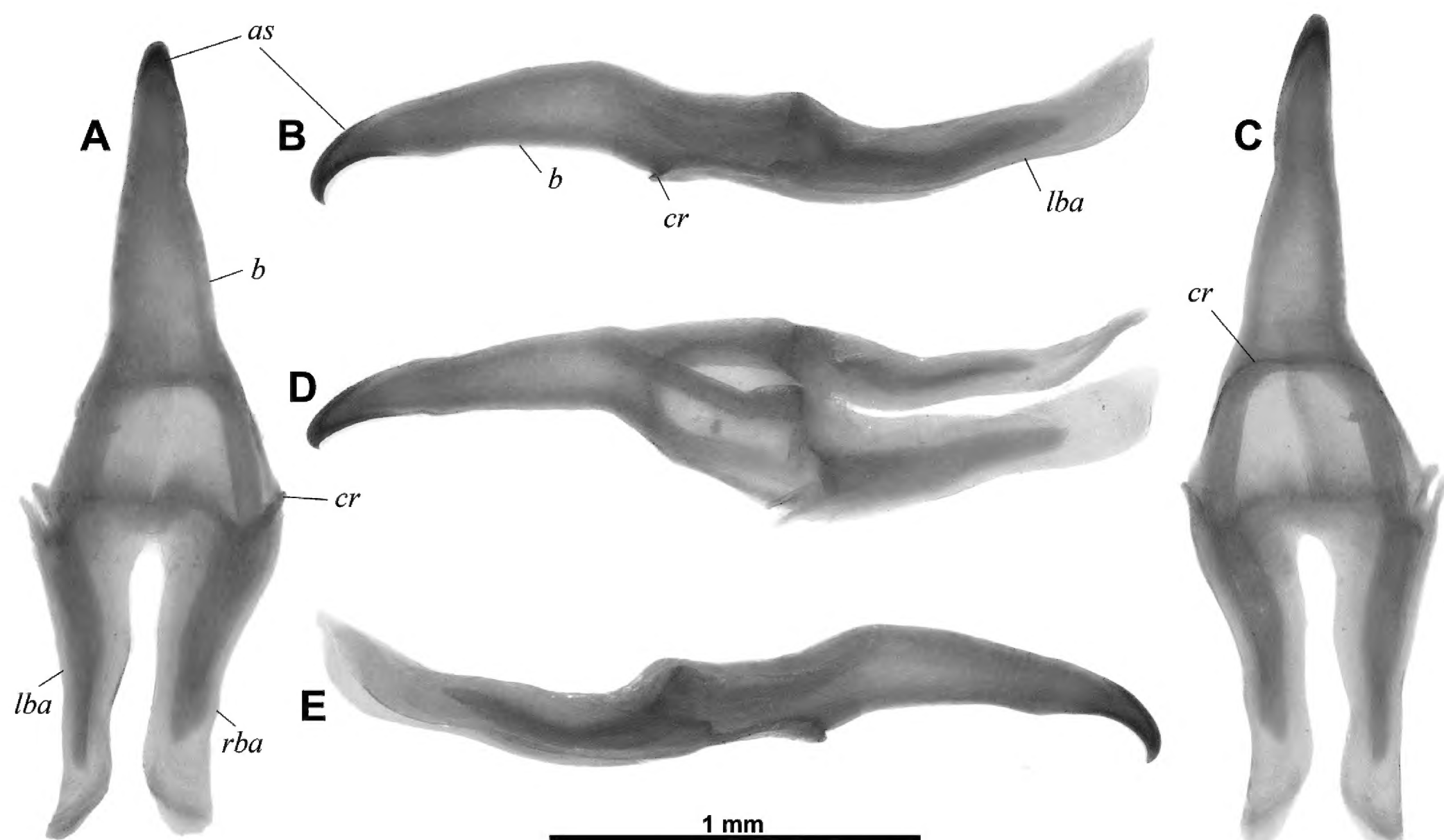


Fig. 4. *Presbistus vitivorus* sp. nov. male vomer. A. Ventral view; B. Left lateral view; C. Dorsal view; D. Ventrolateral view; E. Right lateral view. Abbreviations: *as*, apical spine. *b*, body. *cr*, connective ring. *lba*, left basal apodeme. *rba*, right basal apodeme.

Legs. (Fig. 6A, B) As in male.

Abdomen. (Figs 6A, B, D, 7) Terga II–V of uniform width, terga VI–VIII slightly widening towards the posterior (this feature usually only visible in living specimens and especially in females with the abdomen swollen with eggs). Terga VII–X getting progressively shorter with VIII–X tectiform. Tergum VIII expanding laterally with lateral margin rounded. Anal segment slightly shorter than tergum IX; apex concave with minute epiproct visible in dorsal view. Cerci narrow, circular in cross section. Sternum VII with praeopercular organ present as a posterior depression with indistinct lateral carinae, indistinctly projecting over base of subgenital plate and concave posteriorly. Subgenital plate with anterior portion globose and with minute impression basally; posterior portion with distinct mediolongitudinal carina, narrowing towards the posterior with apex roundly pointed.

Nymph. (Fig. 8) Newly hatched nymphs have a pinkish body and head. Antennae longer than head and body combined, orange with evenly spaced black markings. Legs slightly setose and completely orange.

Egg. (Fig. 9) Measurements [mm]: length 1.9, width 0.9, height 1.5. Capsule dark reddish brown, surface minutely punctate without setae; lentil shaped and laterally compressed. Micropylar plate colored like capsule, long and narrow, longitudinally carinate laterally and medially, extending from the operculum across the polar end and back to the operculum. Micropylar cup distinct, displaced towards the polar area; operculum elongate oval, not punctate, with a raised elongate oval ridge centrally.

Biology.—Wild specimens were found in Phnom Samkos on Vitaceae (identification of the wild Vitaceae by A. Trias-Blasi, pers. com., VII.2019) species belonging to the genus *Tetrastigma* (Miq.) Planch.

Table 1. Measurements [mm] of *Presbistus vitivorus* sp. nov.

| Length of | HT ♂ | PT ♂♂ | PT ♀♀ |
|----------------|------|------------------|-----------|
| Body | 44.6 | 42.2–44.1 | 50.8–57.4 |
| Head | 2.6 | 2.4–2.6 | 3.1–3.5 |
| Pronotum | 3.3 | 3.1–3.4 | 3.9–4.4 |
| Mesonotum | 5.5 | 5.5–5.8 | 6.8–7.6 |
| Tegmina | 1.7 | 1.7–2.0 | 2.2–2.4 |
| Alae | 23.5 | 21.8–24.6 | 27.6–30.0 |
| Metanotum | 2.1 | covered by wings | 4.0* |
| Median segment | 3.6 | covered by wings | 4.9* |
| Profemora | 7.6 | 7.2–8.2 | 8.4–9.4 |
| Mesofemora | 5.9 | 5.1–6.2 | 6.1–6.9 |
| Metafemora | 10.4 | 9.4–10.8 | 10.9–12.9 |
| Protibiae | 6.7 | 6.3–7.3 | 6.7–7.9 |
| Mesotibiae | 5.9 | 5.2–6.2 | 5.9–6.5 |
| Metatibiae | 10.4 | 9.3–11.1 | 10.0–12.1 |

* only one specimen measured; others were mounted with wings closed.

or *Cayratia* (Baker) Suess. and were fairly numerous on their host plants (Figs 10, 11A–D). Males and females were present in this population, with most males found *in copula* (Fig. 10E). In Be Treed, they were common on Vitaceae of the genus *Ampelocissus* Planch., but only females were found, thus this particular population seems to be parthenogenetic (Fig. 11E–G). From this latter parthenogenetic population, *P. vitivorus* sp. nov. was cultured by T. Bollens (Belgium) on various Vitaceae (*Parthenocissus* spp., *Cissus alata* Jacq., *Vitis vinifera* L.) of which the latter species was the preferred alternative food. The eggs are dropped to the ground, and the young nymphs are bright red in color after hatching but turn green after a few days. They hide mainly underneath leaves and are very fast and hectic when disturbed.

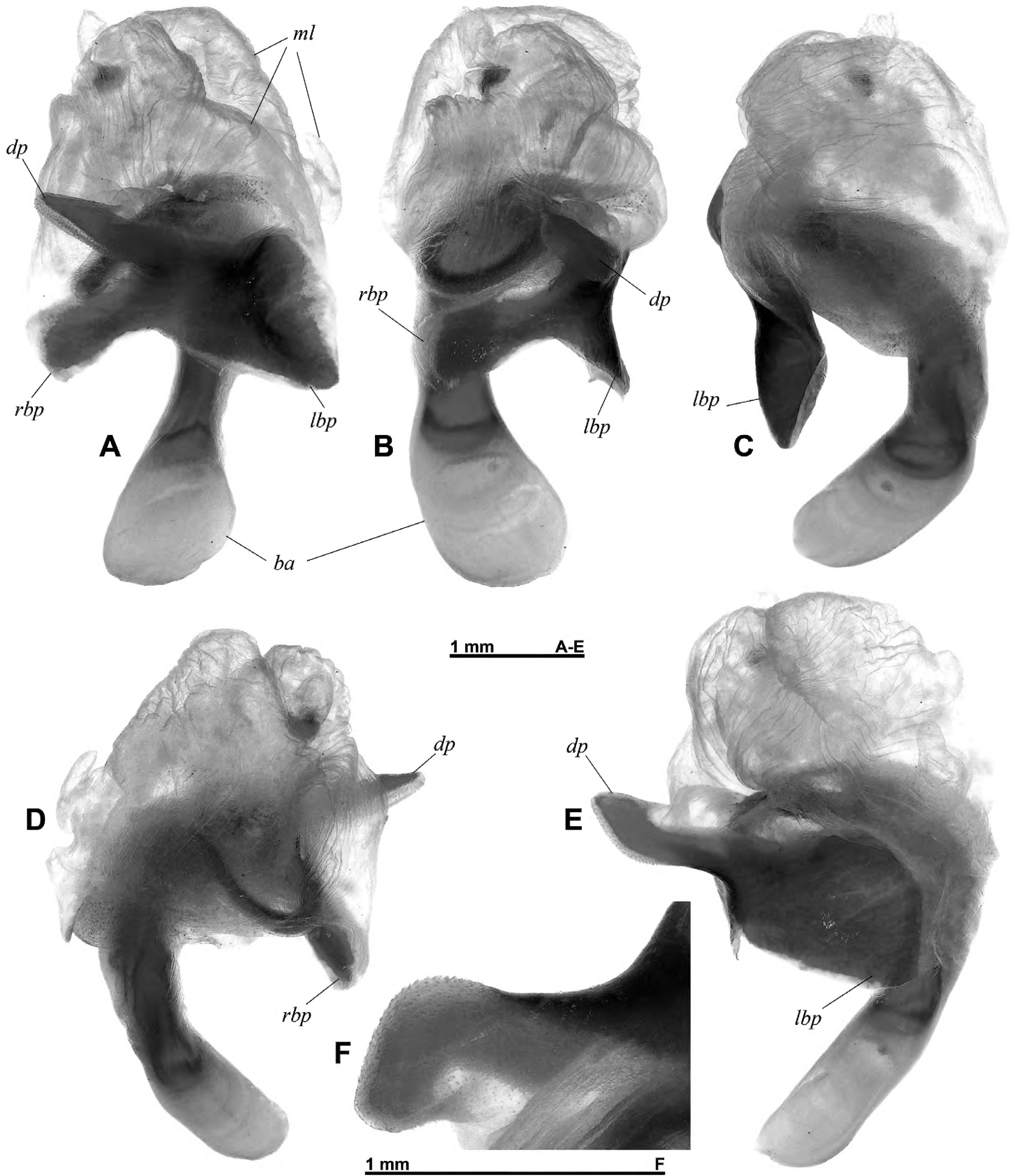


Fig. 5. *Presbistus vitivorus* sp. nov. ♂ aedeagus. A. Dorsal view; B. Right lateral view; C. Left lateral view; D. Ventral view; E. Laterodorsal view; F. Detail of dorsal process. Abbreviations: *ba*, basal apodeme. *dp*, dorsal process. *ml*, membranous lobe. *lbp*, left basal process. *rbp*, right basal process.

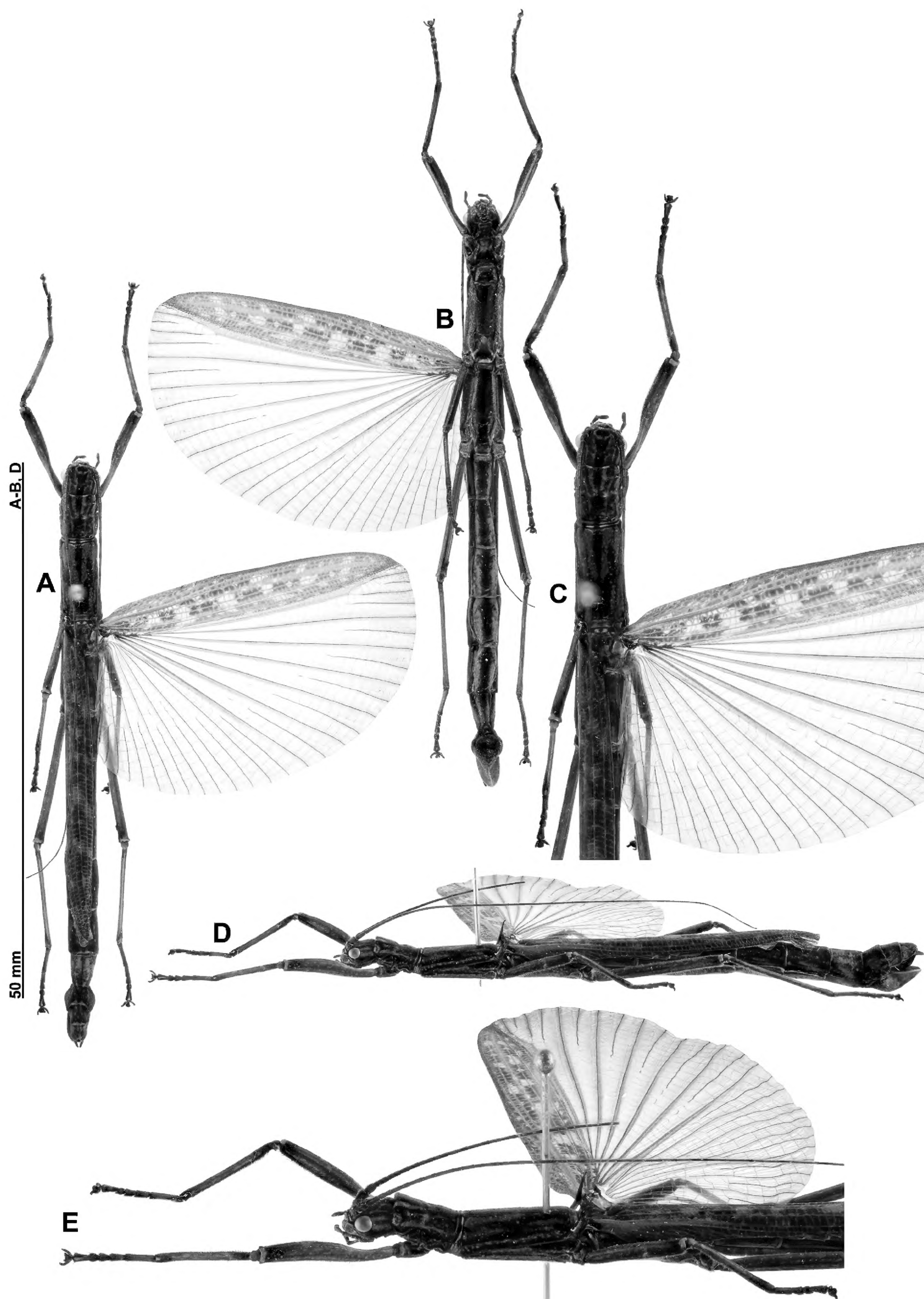


Fig. 6. *Presbistus vitivorus* sp. nov. paratype female (RBINS). A. Dorsal view; B. Ventral view; C. Head and thorax, dorsal view; D. Lateral view; E. Head and thorax, lateral view. C, E not to scale.

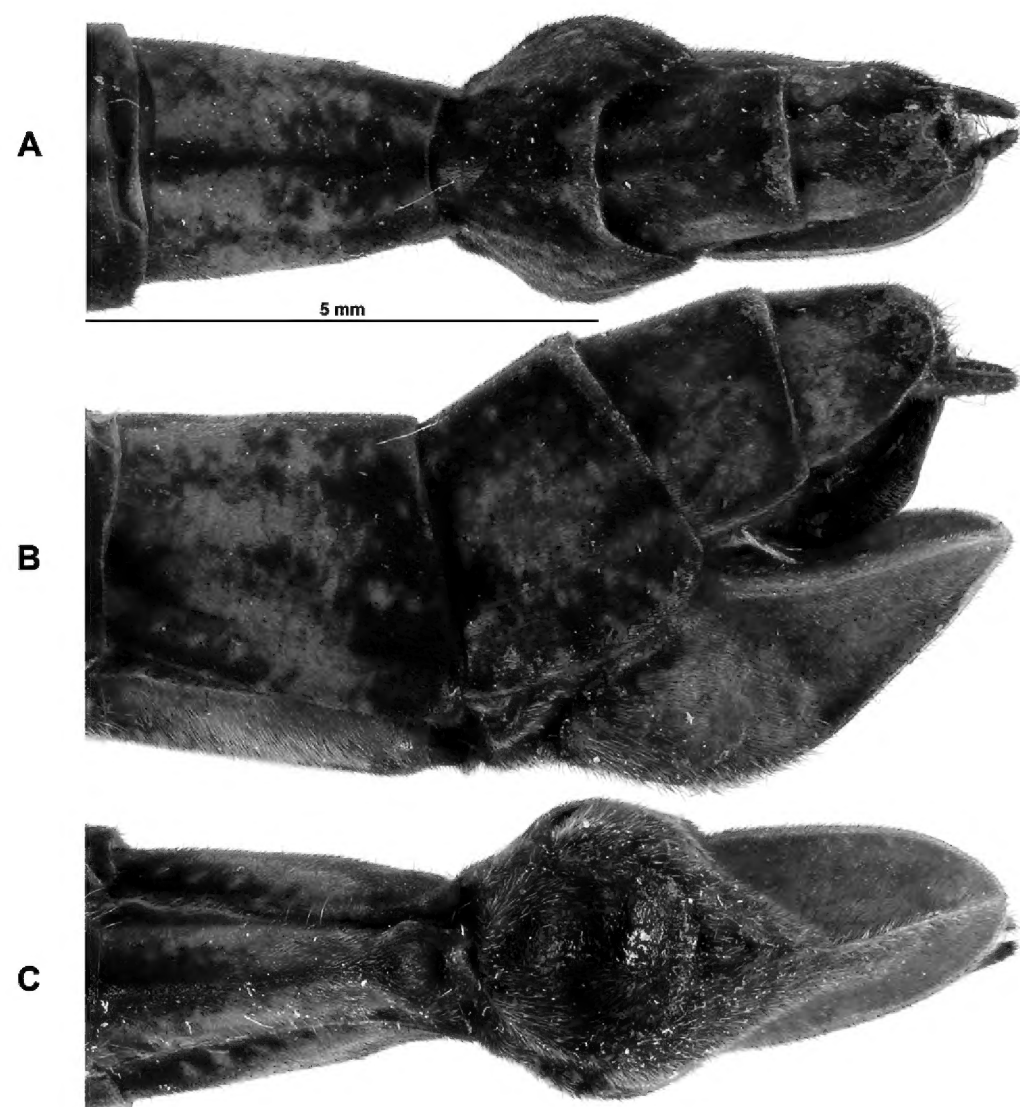


Fig. 7. *Presbistus vitivorus* sp. nov. female, terminalia. A. Dorsal view; B. Lateral view; C. Ventral view.



Fig. 8. *Presbistus vitivorus* sp. nov., newly hatched nymph. Photo credit T. Bollens.

Incubation of eggs was performed without a diapause and lasted 6 months, or with a 5–6 months diapause in the refrigerator and then lasted 4 months after the diapause. Females produce many eggs, with up to 10 eggs dropped per day by each female.

Distribution.—Cambodia: Pursat and Preah Vihear provinces (Fig. 12).

Discussion

Male terminalia.—The morphology of the external terminalia in Aschiphasmataidae was recently studied (Valotto et al. 2016a, b), but the internal male genitalia have remained almost completely

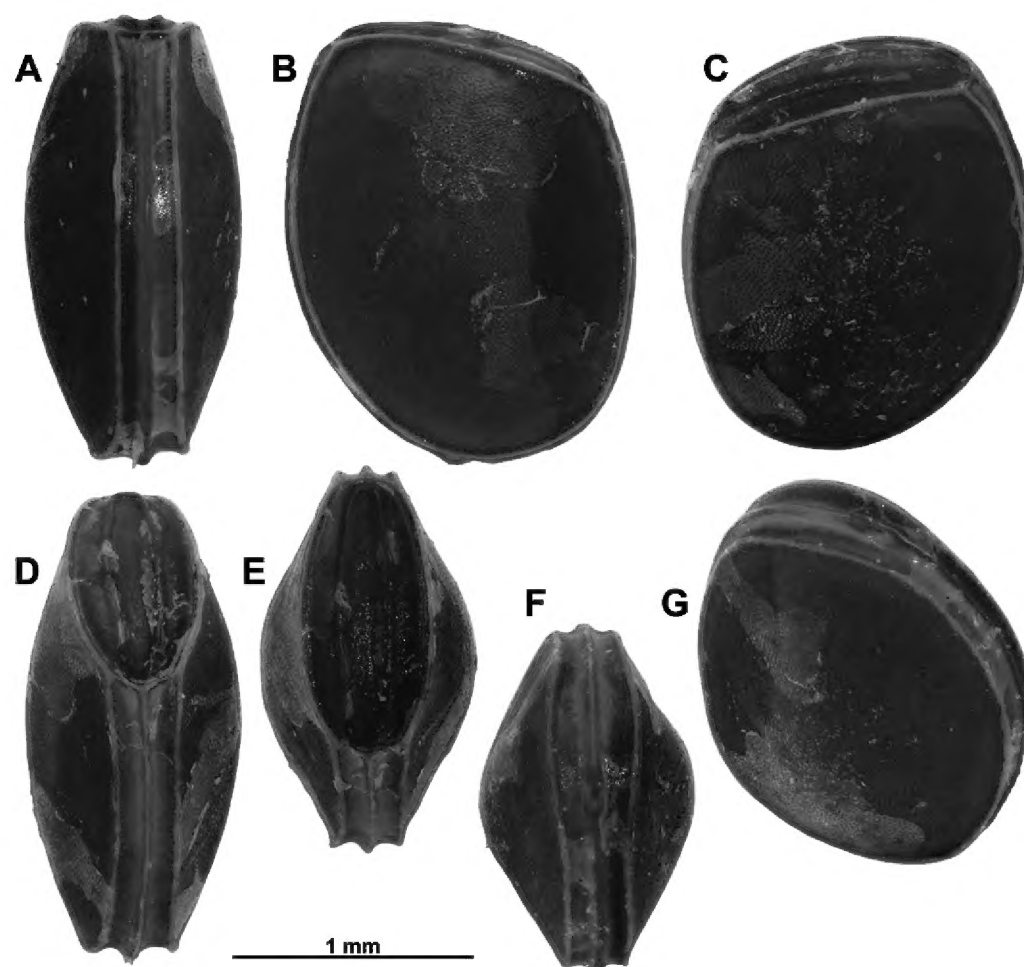


Fig. 9. *Presbistus vitivorus* sp. nov. egg. A. Dorsal view; B. Lateral view; C. Anterolateral view; D. Ventral view; E. Opercular view; F. Polar view; G. Posterolateral view.

undocumented. Several studies provide basic information on phasmid genitalia (Chopard 1920, Walker 1922, Snodgrass 1937), but Helm et al. (2011) provided the first detailed study based on the Oriental species *Oxyartes lamellatus* Kirby, 1904 (Lonchodidae, Necrosiinae). Genitalia in Neotropical taxa were recently studied by Heleodoro and Rafael (2019), Chiquetto-Machado and Canello (2021), and Ghirotto (2021), highlighting the importance of the phallic organ characters for phasmid systematics. At least the large sclerotized and specialized dorsal portion in *Presbistus vitivorus* sp. nov. seems to be homologous to the dorsal sclerite found in all species examined in the previously mentioned studies and coincides with the hypothesis by Helm et al. (2011) that the dorsal sclerite may be present in all or nearly all species of stick insects.

In *Presbistus*, the aedeagus is moderately sclerotized and shows considerable differences when compared to other studied taxa. The aedeagus provides several interesting characters for species differentiation and future phylogenetic considerations, but since our study represents the first documentation of a dissected aedeagus for the subfamily, no conclusions regarding these subjects can be drawn.

The characters of the male vomer are frequently used when describing or differentiating stick insect taxa (Bradler 2009, Bresseel and Constant 2018a, Cumming et al. 2021). The nomenclature proposed here for the dissected vomer can be used in nearly all species, and the structure of the vomer provides useful differential characters when studied from different angles. The suggested nomenclature (Fig. 4) tries to homologize with previously used terms. The vomer of a number of genera has been dissected, such as *Timema* Scudder, 1895 (Timematoidea), *Cryptophyllum* Cumming et al., 2021 (Phyllioidea), *Dajaca* Brunner von Wattenwyl, 1893 (Vallotto et al. 2016a), and *Orthomeria* Kirby, 1904 (Aschiphasmatoidea) (Bradler 1999, Vallotto et al. 2016a, b, Cumming et al. 2021), and these studies show the presence of two basal apodemes (Fig 4: *lba*, *rba*) embedded in the body. The structure and direction of these apodemes can differ considerably between genera.



Fig. 10. *Presbistus vitivorus* sp. nov. in nature in Cambodia, Phnom Samkos, 16.X.2016. A. Male on Vitaceae sp., laterodorsal view; B. Ditto, terminalia, lateral view; C. Female on vitaceae sp., laterodorsal view; D. Ditto, dorsal view; E. Pair in copula, lateral view; F. General view of habitat; G. Damage on leaves of Vitaceae sp.



Fig. 11. *Presbistus vitivorus* sp. nov. in nature in Cambodia. A–E. Phnom Samkos, 17.X.2016. A. Female on Vitaceae sp., lateral view; B. Ditto, general view of habitat; C. Host plant, Vitaceae sp., leaves; D. Host plant, fruit; E. Host plant, Vitaceae sp., leaves and fruits; F, G. Be Treed, on *Ampelocissus* sp., 16.X.2017; F. Female, laterodorsal view; G. Female, dorsal view; H. Be Treed, female on *Ampelocissus* sp., 19.X.2017.

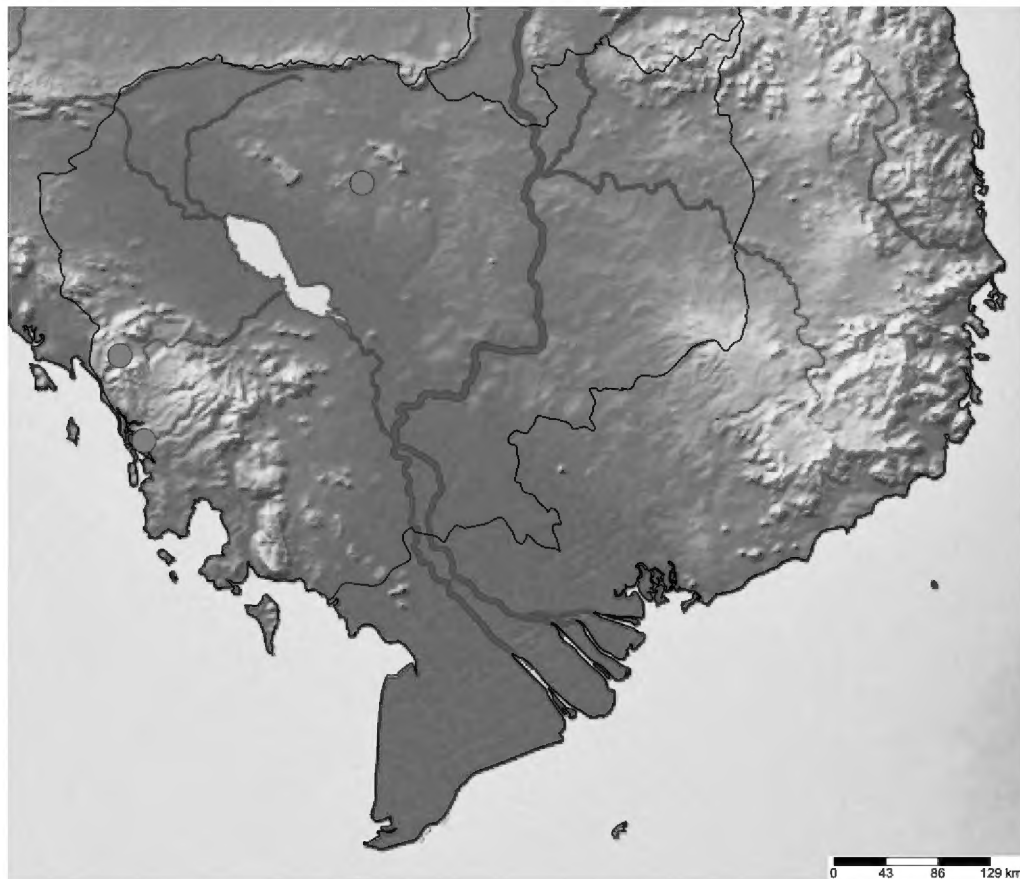


Fig. 12. *Presbistus vitivorus* sp. nov. distribution map.

The body of the vomer (Fig. 4: *b*) refers to the external part of the vomer including the distal ending and is connected to the tegument by the connective ring (Fig. 4: *cr*). The body of the vomer shows considerable variation in shape but most often narrows towards the posterior. This organ can be functionally replaced or can be strongly reduced in genera with a modified tergum X or specialized cerci for clasping the female (Pantel 1915, Bradler 2003, 2009, Hennemann and Conle 2008).

The apical portion of the body of the vomer is often upcurved and armed with one to multiple spines. In many species the vomer ends in a single apical spine (Fig. 4, *as*), referred to as hook(s) or prong(s) by several authors (Bradler 1999, Bradler et al. 2014, Cumming et al. 2021). The apex can sometimes be more complex, bearing two (*Neooxyartes* Ho, 2018, *Cryptophyllum*) or more (*Spinohirasea* Zompro, 2002, *Paramenexenus* Redtenbacher, 1908) sometimes blunt, spines (Hennemann 2007, Bresseel and Constant 2018a, Bradler et al. 2014, Cumming et al. 2021). The body of the vomer can be symmetrical (*Neooxyartes*) to asymmetrical (*Cryptophyllum*) depending on the size and direction of the spine(s) (Bresseel and Constant 2018a, Cumming et al. 2021).

Species diversity and distribution.—With the description of this new taxon there are now ten known *Presbistus* Kirby, 1896 species. The family Aschiphasmatidae is for the first time recorded from Cambodia, with *Presbistus vitivorus* sp. nov. being only the fifth species of stick insect described from the country (Brock et al. 2022).

Presbistus peleus (Gray, 1835), the type species, is the most widespread species in the genus and is recorded from India, Peninsular Malaysia, Singapore, Sumatra, and Borneo (Brock et al. 2022). The holotype originates from “Ora Malabariensi” (Gray 1835), considered the Malabar coast (India) by subsequent authors (Brock 1999, Bragg 2001). However, both authors expressed doubts about the accuracy of the original locality, as all subsequent records originate from Sundaland and the genus has never been confirmed in India. Other species described by Gray (1835) bearing the same collecting data and all “ex collection D. Children” have since been recorded from Peninsular Malaysia (Malacca) (Brock 1999, Bragg 2001). Therefore, the Indian record of *P. peleus* is regarded as erroneous.

Furthermore, from photographs of the holotype female available from Brock et al. 2022, it appears that *P. crudelis* (Westwood, 1859) from Sri Lanka is not congeneric with the type species of *Presbistus*, *P. peleus* (Gray, 1835), and belongs in a separate, yet undescribed genus that differs from *Presbistus* by the almost straight profemora, the comparatively shorter mesonotum, and the spoon-shaped subgenital plate. Hence, the genus *Presbistus* is removed from the list of stick insects from India and Sri Lanka.

With *P. vitivorus* sp. nov. extending the distribution of *Presbistus* to Cambodia, the genus is shown to be distributed over most of Sundaland, comprising Indochina, the Malay Peninsula, Sumatra, Java, and Borneo.

Acknowledgments

We thank Sophany Phauk (RUPP) and his students as well as Dr. Hong Thai Pham (Vietnam National Museum of Nature, Hanoi, Vietnam) and Xavier Vermeersch (RBINS collaborator) for their help, enthusiasm, and friendship during the collecting trips. Myriam Bourguignon and the staff and students of KTA Horteco (Vilvoorde, Belgium) are thanked for cultivating the plants needed for rearing the species in captivity. We also thank Tim Bollens (Herselt, Belgium) for his help in captive rearing of the species and providing additional study material and Cédric Cauquil (Soual, France) for additional information on incubation. Dr. Anna Trias-Blasi (Royal Botanic Gardens, Kew, UK) is thanked for her help in identifying the food plants from our photographs. Thank you to the authorities of Phnom Samkos Wildlife Sanctuary for their support of this study, to Sharyn and Benjamin J. Davis, the managers of Be Treed and the Cambodian Ministry of Environment for allowing and facilitating our research at BeTreed Adventures. Dr. Patrick Grootaert, Dr. Yves Samyn, and Dr. Marie-Lucie Susini (RBINS) are thanked for their permanent support of the project in Cambodia, Mado Berthet (RBINS) for improving the illustrations, and Gerard Chartier (Tatai, Cambodia) for his help in the field and hospitality. This paper is a result of the project “A step further in the entomodiversity of Cambodia” (2016–2017) supported through grants issued by the capacity building program of the Belgian Global Taxonomy Initiative National Focal Point that runs under the CEBioS program with financial support from the Belgian Directorate-General for Development Cooperation.

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